DOCUMENT RESUME

ED 363 491 RC 019 384

AUTHOR Barker, Bruce O.; Hall, Robert F.

TITLE A National Survey of Distance Education Use in Rural School Districts of 300 Students or Less.

SPONS AGENCY Western Illinois Univ., Macomb. Illinois Inst. for Rural Affairs.

PUB DATE Oct 93

NOTE 16p.; Paper presented at the Annual Conference of the National Rural Education Association (85th, Burlington, VT, October 14-17, 1993).

PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS *Administrator Attitudes; *Distance Education; Elementary Secondary Education; National Surveys; Rural Education; *Rural Schools; School Districts; *Small Schools; Telecommunications

IDENTIFIERS *Small School Districts

ABSTRACT

Distance education technologies can help rural schools overcome the disadvantages of geographic isolation by expanding course offerings and learning opportunities and by connecting teachers with resource materials and training programs. Classroom-focused distance learning is distance insensitive and implies simultaneous instruction of several small groups of students at different sites. Network-focused distance learning, on the other hand, is both distance and time insensitive and connotes the use of information sources such as electronic mail, bulletin boards, and databases. A nationwide survey examined distance education practices at 130 rural K-12 public schools in 32 states. Each school comprised an entire school district and enrolled 300 students or less. Half of the schools received classroom-focused learning programs. Satellite-based delivery was the most commonly used technology, followed by cable television. Secondary students were clearly the target audience, with less than 10 percent of distance learning programs intended for elementary students. Staff development programs were used by many schools but typically did not exceed 15-20 hours per year. Principals indicated that the greatest programming needs were in foreign languages, mathematics, science, and vocational education. Half felt that parents and teachers strongly supported distance learning and that teachers would pursue graduate degree programs through distance learning if available. Includes the survey questionnaire. (SV)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 363 491

A National Survey of Distance Education Use in Rural School Districts of 300 Students or Less

Paper presented at
the 85th Annual Conference of the
National Rural Education Association

Burlington, Vermont
October 14-17, 1993

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Bruce O. Barker
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

by

Bruce O. Barker
Professor and Chairman
Department of Media and Educational Technology
College of Education
Western Illinois University

Robert F. Hall
Associate Professor
Department of Educational Administration and Supervision
College of Education
Western Illinois University

This study was completed under the auspices of the **Illinois Center for Rural Education Studies** and was funded by the **Illinois Institute for Rural Affairs.** Both entities are housed at Western Illinois University, Macomb, Illinois 61455

RC 019384

BEST COPY AVAILABLE

A National Survey of Distance Education Use in Rural School Districts of 300 Students or Less

Low student enrollments and geographical isolation of most rural schools have created unique challenges for educators hoping to provide rural youth with educational opportunities equal to students living in urban or metropolitan areas and attending large school systems. Depending on the data cited and definitions of "ruralness" used, America's rural schools enroll between 17 and 33 percent of all school aged children and comprise between 28 and 67 percent of all schools (Geiger, 1992; Lewis, 1991; Matthes and Carlson, 1987; U.S. Department of Education, 1991). Irrespective of exact figures or variance in definitions, rural schools typically face the multiple challenges of (1) limited course offerings for students; (2) providing high quality staff development opportunities for teachers who are usually geographically isolated from professional counterparts in other schools; (3) recruiting and retaining qualified teachers; (4) equitable funding for student programs, teacher salaries, and capital improvements in comparison to urban and suburban districts; and (5) lack of specialized services (Cole, 1991; Jolly, 1993; Monk, 1989).

New Technologies Impacting Rural Schools

While schools in the mid-1980's were fortunate to have several computers for student use as well as teacher access to videocassette players/recorders (VCRs), if schools today are to be on the "cutting edge" of technology they should also have access to satellite links, telecommunications networks, electronic databases, and multimedia .

These present day technologies are able to extensively broaden student learning opportunities and at the same time "connect" teachers with new resource materials and experts across the country enabling them to participate in inservice training programs.. This is especially true of developments in distance learning and telecommunications -- particularly satellite, fiber optics, digital transmissions, electronic bulletin boards (EBBs), distant databases, facsimile machines, video telephones, etc. These technologies seem to have the greatest potential in helping rural schools overcome the disadvantages of remoteness and geographical isolation where shortages in specialized staff, low student enrollments, and small numbers of special needs

students severely limit program offerings for students and staff development opportunities for teachers and administrators.

Defining Telecommunicated Distance Learning

Two significant features must be considered in any attempt to define telecommunicated distance learning -- distance education is learning which can be *time* insensitive and/or *distance* insensitive. Any definition would be incomplete without addressing both these factors. In this paper, two definitions are presented: (1) classroom-focused distance learning which is *distant*ce insensitive, and (2) network-focused distance learning which is both *time and distance* insensitive (Barker and Taylor, 1993).

Classroom-Focused Distance Learning: The live, simultaneous transmission of a teacher's lessons from a host classroom or studio to multiple receive-site classrooms in distant locations. Two-way, live communication in real time, whether audio or video between the teacher and students, permits the instruction to be interactive. This model implies that instruction is oriented more toward small groups or clusters of students at different sites than to an individual student. Under ideal conditions, students at any one site are not only provided direct contact with their instructor but are also able to communicate directly with students at other remote sites during the instructional process.

Network-Focused Distance Learning: Student-initiated data gathering and interactive communication via an electronic network which results in learning. In today's global society, much learning and interactive communication can and does occur through the simple use of a standard microcomputer and modem at the convenience of the user. More than 5000 electronic databases and thousands of electronic bulletin boards (EBBs) are accessible on-line in the United States (*Directory of On-line Databases,* 1993). These services, coupled with electronic mail (E-mail), permit individuals to independently gather information, keep current on virtually any topic of interest, and communicate with others across the country or around the world at their own *time* convenience regardless of the distances involved. The potential for learning via telecommunications networks and/or E-mail exchange is incomprehensible. In fact, it is plausible

that network-focused distance learning which is both *time and distance insensitive* --- as evidenced by the exponential growth of electronic databases, EBBs, and E-mail services -- may one day eclipse the practice of classroom-focused distance learning.

For the most part, these two forms of distance learning seem to operate independent of each other. As time goes on, however, it can be expected that educational practice will merge the two in support of classroom-focused distance learning programs which also direct the student to independently connect to telecommunications networks in order to conduct E-mail dialogue with other students or subject matter experts and to access large databases for research purposes.

Purpose and Methodology of this Study

The purpose of this study was to contact school administrators in single campus K-12 school districts in the United States that enroll 300 students or less and ascertain from them the extent to which students and teachers at their schools participate in classroom-focused distance learning programs, interest in receiving distance learning programs, specific programming needs, and equipment resources among rural schools for participating in distance learning programs. Research questions of interest included the following:

- To what extent are rural schools receiving/participating in classroom-focused distance learning programs?
- To what extent are rural schools interested in receiving classroom-focused distance learning programs?
- How many schools have satellite down-link dishes?
- What kinds of technology are being used for distance learning(satellite, cable, ITFS, compression, fiber optics, computer networks, etc.)?
- What is the level of funding (dollar amount estimates) that most rural schools are able to commit to distance learning equipment and programs?
- What kinds of video equipment (TVs, cameras, etc.) are available in rural schools which could be used to receive televised instructional broadcasts?
- How pervasive are telecommunications devices in rural schools (speaker telephones, fax machines, video telephones, modems, computers, satellite dishes, etc.)?
- From the perception of school administrators, what are the greatest curriculum needs (courses) for rural school children/youth?
- What are the most significant teacher inservice or training needs?
- To what extent are classroom teachers interested in pursuing graduate degree programs offered via distance learning?
- What kind of community support at the local level has been provided/expressed for distance learning in rural schools?

- What kind of priority do local school administrators place on distance learning as an instructional option?

A mailing list of K-12 public schools in the United States enrolling 300 students or less was purchased in April 1993 from Market Data Retrieval Incorporated, Shelton, Connecticut. The mailing list identified 1862 schools. Upon review of the mailing list, it was noted that it included alternative schools (eg. detention centers, schools for unwed mothers, vocational centers, adult learning centers,etc.), some middle schools, some elementary schools, and some high schools. These schools were removed from the mailing list, leaving a universe of 967 qualifying schools which were deemed by their names (and titles) to be single campus K-12 public schools. It was deemed by the researchers that most of these schools, by their nature, were located in rural communities. Of these, 311 were randomly selected for study purposes. In May of 1993, a 16 item self-administered questionnaire (see Appendix) and pre-paid return mailer was mailed to the attention of the building principal in each of the 311 selected schools. A total of 136 questionnaires were returned, of which 130 represented K-12 public schools of 300 students or less. The six questionnaires from non-qualifying schools were removed from the study, leaving 130 usable questionnaires representing a return rate of 41.8 percent. The Statistical Package for the Social Sciences (SPSS) computer program was used to tabulate data collected from the survey instrument.

Research Results

Questionnaires were returned from schools in 32 states. The greatest response came from Nebraska, 18 schools; followed by Texas, 17 schools; North Dakota, 11 schools; Missouri, 7 schools; South Dakota, 6 schools; Colorado and Montana, 5 schools each; Idaho, Illinois, Michigan, New York, Oklahoma, Washington, and Wyoming, 4 schools each. Other states represented with either three, two, or one school included Arizona, Arkansas, California, Florida, Georgia, Indiana, Iowa, Kansas, Maine, Minnesota, New Hampshire, New Mexico, North Carolina, Oregon, Pennsylvania, Tennessee, Utah, and Vermont.

The average K-12 enrollment of participating schools was 198.3 students. The mean breakdown for elementary students (K-6) was 104.2 and for secondary students (7-12) was 95.7.

The mean number of instructional faculty at each school was 22.8, resulting in a teacher-student ratio of 1 to 8.7.

Of the schools surveyed, 65 (or 50.0 percent) reported that they participated in a classroom-focused distance learning program. Of these, 48 schools (36.9 percent of total survey) reported use of televised satellite delivered programs. Types of satellites used in schools were broken down as follows: C-band, 10.8 percent, Ku-band, 6.9 percent, and both C-band and Ku-band, 19.2 percent. A total of 27 schools, 20.8 percent reported use of cable television for distance learning. Only 12 schools, 9.2 percent reported use of televised CODEC units (coder/de-coder systems) using either TS1, DS3, or fiber optic lines. Similarly, 12 schools also reported use of audiographics systems or computer networks for distance learning. And, nine schools indicated they used microwave signals or an ITFS system (Instructional Television Fixed Services) as a distance learning technology option. See Table 1.

Regarding access to technologies for distance learning, participating schools reported access to the following equipment items: C-band satellite dish, 44 schools, 33.8 percent; Ku-band satellite dish, 32 schools, 24.6 percent; CODEC unit(s), 12 schools, 9.2 percent; facsimile machine/s, 39 schools, 30.0 percent; computer modem/s, 52 schools, 40.0 percent; TV monitor/s, 58 schools, 44.6 percent; video telephone/s, 5 schools, 3.8 percent; speaker telephone/s, 31 schools, 23.8 percent; video camera/s, 41 schools, 31.5 percent; and microcomputer/s for audiographics, 54 schools, 41.5 percent. See Table 2.

A total of 60 schools reported specific vendors/providers from whom they received classroom-focused distance learning programs. The most frequently reported of these were satellite delivered systems. These included TI-IN Westcott Telecommunications, Dallas, Texas, 15 schools (11.5 percent); Satellite Telecommunications Educational Programming (STEP) Spokane, Washington, 11 schools (8.5 percent); Oklahoma State University's Arts and Sciences Teleconferencing Service (ASTS), 6 schools (4.6 percent); and the Satellite Education Resources Consortium (SERC), Columbia, South Carolina, 6 schools, (4.6 percent). The remaining 20 providers identified by schools represented computer-based telecommunications networks, local

TABLE 1

TYPES OF TECHNOLOGIES USED BY K-12 SINGLE CAMPUS SCHOOLS OF 300 STUDENTS OR LESS TO RECEIVE CLASSROOM-FOCUSED DISTANCE LEARNING PROGRAMS. AND, SPECIFIC TYPES OF TECHNOLOGIES ACCESSIBLE TO SCHOOLS FOR DISTANCE LEARNING. REPORTED BY SCHOOL PRINCIPALS, MAY 1993.

Type of Technologies **Used** for Distance Learning	N	Percent
C-band satellite dish	14	10.8
Ku-band satellite dish	9	6.9
Both C-Band and Ku-band satellite dishes	25	19.2
Cable television	27	20.8
CODEC systems	12	9.2
Audiographic systems	12	9.2
Microwave (ITFS systems)	9	6.9
Type of Technologies Available for Distance Learning	**N**	**Percent**
C-band satellite dish	44	33.8
Ku-band satellite dish	32	24.6
CODEC units	12	9.2
Facsimile machine(s)	39	30.0
Computer modem(s)	52	40.0
Computer(s) for audiographics	54	41.5
Television monitor(s)	58	44.6
Video camera(s)	41	31.5
Speaker telephone(s)	31	23.8
Video telephone(s)	5	3.8

TABLE 2

PERCENT OF CLASSROOM-FOCUSED DISTANCE LEARNING PROGRAMS RECEIVED FOR ELEMENTARY STUDENTS IN COMPARISON TO SECONDARY STUDENTS AT SINGLE CAMPUS K-12 SCHOOL DISTRICTS OF 300 STUDENTS OR LESS REPORTING USE OF DISTANCE LEARNING PROGRAMS. REPORTED BY PRINCIPALS, MAY 1993.

Intended Audience	N	Percent
Elementary students (K-6)	64	9.6
Secondary students (7-12)	65	64.0

Principals' estimate of distance education delivered inservice training for staff during 1992-93 academic year: 14.0 hours; N=65.

Principals' estimate of average amount of dollars expended for distance learning programming during 1992-93 academic year: $6,838; N = 65.

Principals' estimate of total dollars invested in distance learning equipment at their school: $19,335; N = 56.

television cooperatives, educational service unit providers, etc.

Extent of distance learning programs received by participating schools were markedly directed to secondary students. Principals reporting use of distance learning at their school estimated that 64.0 percent of all programs received were geared to secondary students. Those reporting use of elementary programming, estimated that only 9.6 percent were geared to elementary students. Principals estimated that the total number of hours of staff development programs received during the year was 14.0 . Principals estimated that the mean total dollars expended during the past academic year to participate in distance learning programs at their school was $6,838. Those participating in distance learning estimated that the mean total dollar investment in distance learning equipment at their school was $19,335.

Principals noted that by far the greatest curricula need for distance learning programs servicing secondary students in their school was foreign language courses, followed by advanced mathematics and science courses, then vocational education courses. Likewise, they reported that the greatest need for elementary students was foreign language courses, followed by science and English. They reported that the greatest needs for staff development programs were in the areas of technology and instructional design with emphasis also being given to student motivation, student assessment, outcome based teaching, multicultural education, special education, and school effectiveness.

On a Likert scale of "1" to "5," where "1" represented "strongly disagree" and "5" represented "strongly agree," almost all school principals (78.8 percent) felt that distance learning was a viable means of providing curriculum equity for students at their school. Just over one-half of the principals (52.1 percent) felt that parents and teachers in their school were supportive of distance learning efforts. And, less than one-half (46.3 percent) reported that teachers in their school would be interested in earning a master's degree via distance learning provided such programs were available. See Table 3.

TABLE 3

PRINCIPAL ATTITUDES REGARDING VALUE OF CLASSROOM-FOCUSED DISTANCE LEARNING PROGRAMS RECEIVED AT THEIR SCHOOL. REPORTED ON A LIKERT SCALE OF "1" TO "5" WHERE "1" REPRESENTS "STRONGLY DISAGREE" AND "5" REPRESENTS "STRONGLY AGREE." REPORTED BY PRINCIPALS OF SINGLE CAMPUS K-12 SCHOOL DISTRICTS ENROLLING 300 STUDENTS OR LESS, MAY 1993.

Statement	N	Mean Rating	Percent Disagree	Percent Neutral	Percent Agree
Teachers at my school would be interested in earning graduate degrees via distance learning if such programs were offered.	119	3.4	23.4	30.3	46.3
As a school administrator, I see distance learning as a viable means to provide curriculum equity for students in my school.	118	4.1	10.2	11.0	78.8
The local community (parents, etc.) support distance learning efforts in my school.	113	3.6	16.0	31.9	52.1

Conclusion

Based on information gathered in this study, there are just under 1000 single campus K-12 school districts in the United States which enroll 300 students or less and virtually all these are located in rural settings. Findings from a random sample of 130 schools in this population, suggests that half of these schools are active participants in receiving classroom-focused distance learning programs. Satellite-based programs are by far the technology of choice used by most schools, with a sizable number of schools having access to both C-band and Ku-band satellite down-link receive dishes. Commercial vendors such as TI-IN, STEP, ASTS, and SERC are the major providers of distance learning programs to our nation's smallest school systems. Next to satellite-delivered programs, the next most frequent technology used for distance learning is cable television followed by computer-based audiographic networks and televised CODEC systems operating on either TS1, DS3, or fiber optics terrestrial lines. Most users of these systems are organized into local cooperatives which share human, financial, and technological resources.

Secondary students are clearly the target audience for most distance learning programs. Less than 10 percent of distance learning programs received by small schools is intended for elementary school students. Staff development programs are used by many schools, but typically do not exceed 15-20 hours of programming per year.

Many of our nation's small schools have access to technologies which facilitate receipt of distance learning programs. Between one-half to two-thirds either own or have access to a C-band or Ku-band down-link dish. Just under one-half have access to video cameras, television monitors, computer modems, and computers which could be used for distance education networking purposes. About one in four have facsimile machines and speaker telephones. Few schools presently have access to either video telephones or CODEC TV units.

Most single campus school districts participating in distance learning programs have a capital investment between $19,000 to $20,000 in telecommunications equipment and expended approximately $7,000 in programs received for the 1992-93 academic year.

According to school principals, the greatest programming needs for secondary students are

in foreign languages, mathematics, science, and vocational education. The greatest needs for elementary students are foreign languages, sciences, and English. Staff development needs cover a variety of topics.

The vast majority of school principals view distance learning as a means to expand curricular offerings, especially for secondary students, in their school. Approximately one-half feel there is strong support for distance learning from parents and teachers in their community and that teachers would pursue graduate degree programs through distance learning provided such programs were available at their school.

Improvements in telecommunications have made it increasingly easy to transmit instruction, access information, and share electronic messages over geographically forbidding distances. New and advancing technologies are reaching out to diverse audiences providing increased opportunities for education and communication. The benefit to rural schools is obvious. The traditional barriers of remoteness and geographical isolation are bridged by today's telecommunication technologies. It remains for educators and community leaders in rural areas to find ways to make these resources a part of their school's educational program.

References

Barker, B.O. and Taylor, D.R. (1993). An Overview of Distance Learning and Telecommunications in Rural Schools. Paper presented at the 58th annual conference of the National Association of Counties. Chicago, July 16-20.

Cole, R. (1991). Ghosts in small-town schools. *The Education Digest*, 56 (8):7-11.

Directory of On-line Databases. (1993). Detroit: Gale Research Incorporated.

Geiger, K. (1992). The forgotten America: Schools and development in rural areas. *Education Week*, 4, January 15.

Jolly, D.V. (1993). Alternative organizational plans for rural small schools: Options for consideration. Paper presented at the Second Annual National Conference on Creating the Quality School. Oklahoma City, Oklahoma, March 25-27.

Lewis, A. (1991). *Rural Schools on the Road to Reform*. Washington, D.C.: Council for Educational Development and Research, Office of Educational Research and Improvement.

Matthes, W.A. and Carlson, R.V. (1987). Why do teachers choose rural schools? *The Education Digest*, 52 (February), 27-29.

Monk, D.H. (1989). An alternative to the traditional funding of small, rural schools. In *Rural Education: A Changing Landscape*, 31-36. Washington, D.C.: U.S. Department of Education, Educational Networks Division and Office of Educational Research and Improvement.

U.S. Department of Education. (1991). National School Demographics. Printed in *Rural Education: Issues and Strategies* . Albany, N.Y.: The University of the State of New York and the State Education Department, April 1992.

APPENDIX

Rural Education Distance Learning Survey

Instructions: The purpose of this national survey is to gather information from small schools throughout the United States regarding: (1) their interest in distance learning programs delivered by satellite, fiber optics or other forms of telecommunications; (2) schools' specific programming needs for distance learning courses; and (3) distance learning equipment needs and/or capabilities in our nation's small schools. Please **circle** appropriate answer(s) or **write in** answer(s) where requested.

1. In what state is your school located ?_____
2. ESTIMATE the total student enrollment of your school._____ total students
   _____elementary students (K-6) _____ secondary students (7-12)
   _____ total instructional faculty
3. Does your school receive distance learning programs? (circle)
   a) yes b) no

If "no" skip to questions 11-15 of this questionnaire.

If "yes" please answer all of the following questions.

4. **Circle** the type of technology(s) use for distance learning at your school (circle all that apply)
   a. satellite delivered distance learning
      C-band Ku -band both (**circle**)
   b. codec units on T-1 or fiber optic lines
   c. computer networking (audiographics)
   d. ITFS signal (microwave)
   e. cable television
   f. other _____

5. Listed below are numerous equipment items. Please **CIRCLE** items which ***you have at your school and which are used for distance learning***: (circle all that apply)
   a. C-band satellite dish b. Ku-band satellite dish
   c. codec unit d. fax machine(s)
   e. modem f. TV monitor
   g. video telephone h. speaker telephone
   i. regular telephone j. video camera(s)
   k. computer(s) k. other _____

6. Name the provider/vendor or describe who provides distance learning programs to your school?

7. Of the distance learning programs received at your school, ESTIMATE the percent of ***programs*** used for ***elementary*** students and the percent used for ***secondary*** students.
   _____ percent elementary _____ percent secondary

8. ESTIMATE the number of hours of staff development (inservice training) received this past year via distance learning at your school.
   _____ hours of staff development

9. ESTIMATE the dollar amount expended this past academic year for distance learning programs received at your school (e.g. subscription fees, etc.; include fees for student programming as well as staff development fees if you receive both).
   _____ dollars

APPENDIX

10. ESTIMATE the dollar amount invested in distance learning equipment at your school.
_____ dollars

11. List below (in rank order) the greatest curriculum needs (courses) at your school for secondary students?

12. List below (in rank order) the greatest curriculum needs at your school for elementary students.

13. List below (in rank order) the most significant staff development needs (inservice courses/programs) at your school.

Please answer the questions below on the following five point scale where "1" represents "strongly disagree" and "5" represents "strongly agree."

	Strongly Disagree				Strongly Agree
14. Teachers at my school would be interested in earning graduate degrees via distance learning if such programs were offered.	1	2	3	4	5
15. As a school administrator, I see distance learning as a viable means to provide curriculum equity for students in my school.	1	2	3	4	5
16. The local community (parents, etc.) support distance learning efforts in my school.	1	2	3	4	5

Additional comments if any: